DOCUMENT RESUME

ED 211 930 CS 006 433

AUTHOR Brittain, Mary M.
TITLE Teacher Awareness of Cognitive Complexities in Social Studies Materials.
PUB DATE Oct 81
NOTE 12p.; Paper presented at the Annual Meeting of the College Reading Association (Louisville, KY, October 29-31, 1981).

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Cognitive Processes; Content Area Reading; *Difficulty Level; Elementary School Teachers; Grade 6; Intermediate Grades; *Perception; Readability; Reading Comprehension; *Reading Research; *Social Studies; Teaching Experience; Teaching Skills; *Textbook Evaluation; Undergraduate Students; Vocabulary

ABSTRACT

An 11 page chapter from a sixth grade social studies text was used in a study assessing the complexities of comprehending social studies materials and the sensitivity of prospective and experienced teachers to these complexities. A sentence-by-sentence analysis of the thinking operations required for mastery of the material showed that numerous cognitive operations were required, including literal recognition of stated facts, detection of cause and effect, recognition of relationships between main ideas and details, recognition of statements of opinion, and resistance to emotional appeals. The readability of six samples from the selection, based on the Dale-Chall formula, varied from grades 6.2 to 11, with an average at grade 8. Nineteen undergraduate and 21 graduate students serving as prospective and experienced teachers, respectively, completed a cloze exercise assessing their comprehension of the chapter. The cloze scores ranged from 39% to 70% for the prospective teachers and from 44% to 75% for the experienced teachers. The graduate students showed a clearer understanding of the learning task by being more selective in their labeling of both difficult vocabulary and crucial vocabulary. When constructing questions to measure pupils' comprehension of the material, both groups tended to ask more questions at the literal level. The graduates, however, depended less on detail-type questions and maintained a balance of question types that included comparisons, cause and effect relationships, and making inferences. (RL)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED211930

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION
CENTER (ERIC)

This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

Teacher Awareness of Cognitive Complexities in Social Studies Materials

Mary M. Brittain
Virginia Commonwealth University

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Mary M. Brittain

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

Paper presented at the College Reading Association Annual Conference, Louisville, Kentucky, October 29, 1981

CS006433

The comprehension of social studies materials can require a formidable array of intellectual operations. Students whose performance is adequate in materials used for reading instruction per se, may find themselves awash in a sea of difficulties when reading social studies texts because these present unique problems in vocabulary, comprehension and graphic interpretation.

In order to provide their students with the conceptual background and interpretive skills needed to comprehend these materials, teachers must be sensitive to the intellectual demands made on their students. This study is concerned with assessing four facets of the problem:

1. What is the nature and extent of cognitive complexities in social studies materials?
2. Are the materials at a realistic level of reading difficulty?
3. How comprehensible are the materials to prospective and experienced teachers?
4. How sensitive are prospective and experienced teachers to the complexities inherent in the materials?

Methodology

The social studies material analyzed here was a chapter, eleven pages in length, taken from a social studies text intended to be used in the sixth grade. The selection dealt with the social system of India and with the changes that have occurred in the system

during the past century.

Cognitive complexities in the selection were identified through a sentence-by-sentence analysis of the thinking operations required for mastery. This analysis was done by the author and an educational psychologist.

Nineteen undergraduate students in the writer's introductory reading methods course and twenty-one graduate students (all of whom had had teaching experience) participated in the study. These prospective and experienced teachers independently

1. responded to a cloze exercise taken from the selection.
2. identified vocabulary within the selection which they thought would be unfamiliar to a typical sixth-grader and from these items selected a smaller group which they deemed crucial for understanding the selection.
3. constructed as many comprehension questions as they felt would be necessary to be sure a student really understood the selection.

Analysis of the material revealed a wide range of intellectual operations required for comprehension. To begin with, this eleven-page selection included information from history, sociology, economics, religion, psychology and political science.

The vocabulary load was heavy, both in terms of unfamiliar concepts and familiar terms used in unfamiliar ways. Specialized terms like the following abounded: castes, norms, dowry, untouchables, status, Hinduism, Brahmans, Gandhi, secondary groups.

Many words, which a sixth-grader would probably have met in other contexts, assumed new guises in the social studies selection: tan (in the context of tan hides); lot (as in better his lot); scheduled (in scheduled castes); ties (in ties to his village).

In addition, many of the concepts are vague and difficult to define. Consider the following: social system, sanctions, culture, equality, institutions, way of life.

Another potential source of difficulty lies in the emotional quality of the content. It would take a rather sophisticated sixth grader to remain unswayed by the text's sympathetic treatment of Gandhi's struggle to gain India's independence from Great Britain.

The selection also included an unusual graphic portrayal of the distribution of India's population in rural vs. urban areas. The information contained in the graph is stated in another way in the text, "eight out of ten live in rural areas." But no allusion to the graph is made in the text.

The sentence-by-sentence analysis showed that numerous cognitive operations are required for comprehension. These included:

1. Literal recognition of a stated fact, 62 instances
2. Detection of cause-and-effect, 28 instances
3. Recognizing relationships between main ideas and details, 20 instances (some stated as examples, some implicit)
4. Discussing statements of opinion, 18 instances
5. Resisting emotional appeals, 9 instances

6. Making comparisons, 7 instances
7. Following a line of argument, 6 instances
8. Recognizing restatements, 6 instances
9. Hypothesizing, 2 instances
10. Making judgements, 2 instances
11. Recognizing quotations, 2 instances
12. Resolving a paradox, 2 instances

Other operations called for only once were: noting exceptions, following transactions, giving examples, recognizing dates, and thinking beyond the text--a total of 167 comprehension tasks.

Readability of the selection was done through application of the Dale-Chall formula. This formula estimates the reading grade level of materials based upon average sentence length and proportion of unfamiliar words in the selection. A word is considered unfamiliar if it does not appear on the Dale-Chall list of 3000 words.

Six samples of about 100 words each were taken. Each section of the total selection was sampled. The average readability level of these samples was grade 8. There was considerable variability in difficulty level between the samples, ranging from grade 6.2 up to almost eleventh grade level.

The teachers' and prospective teachers' comprehension of the materials was assessed through their responses to a cloze exercise, consisting of the introductory paragraph of each section of the chapter, with every fifth word deleted. The undergraduates' scores ranged from about 39% to 70%, with the median about 52%. Scores

of the graduates ranged from 44% to 75%, with a median of 62%. In two instances the deleted term was not replaced successfully by anyone, graduate or undergraduate, indicating a lack of redundancy and the difficulty of the concepts involved.

The final and most important aspect of the study deals with teachers' sensitivity to the intellectual demands imposed by the social studies material. The first concern was with vocabulary/ concept load. The graduates and undergraduates were asked to identify the words they thought would be unfamiliar to a typical sixth-grader. Here a dichotomy between experienced and prospective teachers emerged.

Twenty-five words were cited as unfamiliar by 50% of the undergraduates while only thirteen were selected by the experienced teachers. All words selected by a majority of the graduates were also chose by a majority of the undergraduates. These included: Brahmans, caste, dowry, Gandhi, hereditary, Hindu, interact, institutions, norms, republic, sanctions, status, untouchables. To this list the undergraduates added the following: constitution, despised, fasted, industrial, investigation, mobility, republic, resources, rural, sacred, secondary, Sparta, and urban.

Of the thirteen words the majority of the graduates cited as "unfamiliar," 7 were also judged to be crucial to understanding the selection. But of the 25 "unfamiliar" words chosen by the undergraduate majority, only 5 (or about one-fifth) were seen as crucial. These were caste, hereditary, norms, status, untouchables. This would seem to indicate that the experienced teachers perhaps had a clearer

idea of what the learning task really required (or at least a higher degree of consensus).

Both prospective and experienced teachers were asked to construct as many questions as they would feel were necessary to measure adequately a pupil's comprehension of the selection. The questions generated by the students were categorized according to Barrett's Taxonomy of Reading Comprehension and also by the types of comprehension questions cited by Fraenkel, with one additional category. The analysis of responses by Barrett's Taxonomy are presented in Table 1. Numbers at the left-hand side of the table indicate different types of comprehension tasks within the levels.

Table 1

QUESTIONS CLASSIFIED UNDER BARRETT'S TAXONOMY:
TEACHERS (G) VS PROSPECTIVE TEACHERS (U)

	LITERAL		INFERENTIAL		EVALUATIVE		APPRECIATIONAL	
	G	U	G	U	G	U	G	U
1.	17%	30%	-	3%	-	-	1%	-
2.	13%	16%	1%	1%	-	-	5%	2%
3.	-	-	-	-	-	-	-	1%
4.	12%	5%	6%	3%	-	-	-	-
5.	23%	15%	9%	5%	-	2%		
6.	-	2%	-	-				
7.			-	-				
8.			1%					
TOTALS	65%	68%	17%	12%	-	2%	6%	3%

RESIDUAL: G 13%, U 16%

It can be seen that both graduates and undergraduates tended to ask more questions at the literal level, which would be expected for expository material. But, within this category, the graduates maintained a better balance of question type. Note in particular their reduced dependence on detail-type questions and their emphasis on questions relating to comparision and cause-and-effect vis-a-vis the undergraduates. The graduates also made more use of inferential and appreciational questions although, interestingly, they refrained from asking questions of an evaluative nature.

Questions tabulated according to a variation of Fraenkel's system are shown in Table 2. The Comparison Category is not listed by Fraenkel.

Table 2

QUESTIONS CLASSIFIED UNDER FRAENKEL'S CATEGORIES:
TEACHERS (G) VS PROSPECTIVE TEACHERS (U)

	G	U
RECALL	19%	35%
EXPLANATORY	32%	25%
PREDICTIVE	-	2%
SYNTHESIS	14%	15%
HEURISTIC	4%	1%
(COMPARISON)	18%	7%
TOTALS	87%	85%
RESIDUAL	13%	16%

Note that the undergraduates tended to ask more questions of a simple recall type than any other, while the experienced teachers preferred questions aimed at cause-and-effect and comparision, two of the most common patterns noted in the analysis of the materials. Notice also the relative unpopularity of predictive and heuristic questions.

A number of questions did not fall neatly into these categorical schemes. Eleven percent of the graduate questions (N=24) and 15 percent of the undergraduates' questions (N=35) dealt with vocabulary and 5 questions (2 from the graduates, 3 from the undergraduates) were judged irrelevant.

Implications

The result of the study have instructional implications both for teachers and for writers of textbooks. First, teachers (and textbook authors) should be apprised, not only of the excessively high levels of readability to be found in content area materials intended for a given grade level, but also of the heavy demands placed upon readers' cognitive abilities because of the materials' inherent complexity. Without an elaborate preparation for reading a selection, in terms of vocabulary and cognitive operations required and of relating content to students' existing experience background, it is folly to expect a typical student to use these materials as an information source.

Second, teachers need to have experience in surveying content area materials for potential impediments to comprehension and in

orienting themselves to promising questioning strategies (those that apply to the structure of the materials).

Finally, both prospective teachers and those with classroom experience, need to acquire a broader range of question types, especially beyond the literal level, engaging their students in high-order thinking, in appreciation, evaluation and creative thought.

The tasks imposed by social studies materials go far beyond those called for by a typical basal text and they do so at a more advanced level of difficulty. As E.L. Thorndike suggested in 1917 "Perhaps it is in their outside reading of stories and in their study of geography, history, and the like, that many school children really learn to read."

BIBLIOGRAPHY

Anderson, R. et al. Frameworks for comprehending discourse. American Educational Research Journal, 14, (1977), 367-381.

Brandwein, P., et al. The Social Sciences: Concepts and Values. New York: Harcourt, Brace, Jovanovich, 1970.

Forgan, H. and Mangrum, C. Teaching Content Area Reading Skills, 2nd ed. Columbus, Ohio: Charles E. Merrill, 1981.

Fraenkel, J. Reading books and asking questions. Prelude. New York: Children's Book Council, 1975. (tape)

Klare, G., Sinaiko, H. and Stolurow, L. The cloze procedure: a convenient readability test for training materials and translations. International Review of Applied Psychology, 21 (1972), 77-106.

Lapp, D. and Flood, J. Teaching Reading to Every Child. New York: Macmillan, 1978.

Smith, R. and Barrett, T. Teaching Reading in the Middle Grades. Reading, Mass.: Addison-Wesley, 1974.

Thorndike, E. Reading as reasoning: a study of mistakes in paragraph reading. Journal of Educational Psychology, 8, (1917), 323-332.